

REMARKS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1-3 and 6-31 are presently active in this case. The present Amendment amends Claims 1, 13-15, 17 and 19 without introducing any new matter.

The outstanding Office Action rejected Claims 13-14 under 35 U.S.C. §112, second paragraph, as indefinite. Claims 1, 17, 19-20 and 20-23 were rejected under 35 U.S.C. §102(b) as anticipated by Arnold et al. (U.S. Patent No. 5,908,997, herein "Arnold"). Claims 1-3, 6-19 and 24-31 were rejected under 35 U.S.C. §102(e) as anticipated by Ezer et al. (U.S. Patent No. 6,275,239, herein "Ezer"). Claims 15 and 21 were rejected under 35 U.S.C. §103(a) as unpatentable over Arnold in view of Ezer.

In response to the rejection of Claims 13-14 under 35 U.S.C. §112, second paragraph, Claims 13-14 are amended. In particular, Claim 13 is amended to recite "if determined to be unused for a predetermined time by the control processor." This change finds non-limiting support in Applicant's specification as originally filed, for example at page 8, lines 16-26. Claim 14 is amended to recite "if the data stored in the internal memory or the program become unused by the coprocessor." This change finds non-limiting support in the specification as originally filed, for example from page 22, line 25 to page 23, line 10. In view of amended Claims 13-14, it is believed that all pending claims are definite and no further rejection on that basis is anticipated. If, however, the Examiner disagrees, the Examiner is invited to telephone the undersigned who will be happy to work with the Examiner in a joint effort to derive mutually acceptable language.

To clarify Applicant's invention, independent Claim 1 is amended to recite "a coprocessor to subserve the control processor to subject audio data of the input data stream to the divided procedures of the audio process sequentially, based on the program fetched by the

control processor, the coprocessor executing multiplication/accumulation addition according to VLIW (Very Long Instruction Word).” These features find non-limiting support from page 25, line 25, to page 26, line 13.

In light of the amendments to independent Claim 1, Applicant traverses the rejection of Claims 1, 17, 19-20 and 22-23 under 35 U.S.C. §102(b), as next discussed.

The outstanding Office Action asserts that Arnold discloses an audio processor which processes an input data stream via an external memory, and includes a coprocessor to subserve the control processor to subject audio data of the input data stream to the divided procedures of the audio process based on the program fetched by control processor,¹ and points out to Arnold’s Figures 2, 3 and 5. However, the input/output subsystem 36 shown in Arnold’s Figure 2, referred to by the outstanding Office Action as external memory, is an external storage and communication unit, including CD-ROM, HDD, FDD, modem, serial ports, and parallel ports, etc.² Such unit does not read upon the claimed external memory, configured to store programs and a group of data used for sequentially executing the divided procedures of the audio process. Accordingly, an IO subsystem providing “communication components including a modem”³ and storage space, as taught by Arnold, *is not* an external memory, wherein a control processor fetches in a program and audio data from the external memory, corresponding to a next one of the procedures, as recited in Applicants’ Claim 1.

Furthermore, Applicant respectfully submits that Arnold’s MIDI coprocessor 94,⁴ allegedly reading upon Applicant’s coprocessor,⁵ is a processor for performing MIDI processing (including pitchbend/modulation process and sounding process) with respect to the entire system, unlike the claimed coprocessor to subserve the control processor, and therefore *does not correspond* to Applicant’s coprocessor to subserve the control processor to

¹ See the outstanding Office Action from page 3, line 20 to page 4, line 5.

² See Arnold at column 5, lines 28-38.

³ See Arnold at column 5, lines 66-67 and from column 7, line 59 to column 8, line 10.

⁴ See Arnold at column 6, lines 25-36.

⁵ See the outstanding Office Action at page 4, line 2.

subject audio data of the input data stream to the divided procedures of the audio process.

In addition, Arnold's MIDI audio subsystem 38, including MIDI sound generator 86, MIDI coprocessor 94 and MIDI scanner 96, includes a hardware structure for speeding up *parallel* processes, such as keyboard scanning, pedal processing, graphics processing, touch screen, MIDI processing.⁶ However, Applicant's claimed coprocessor executes the divided procedures of the audio process *sequentially* based on the program fetched by the control processor, as clarified in Applicant's independent claims. In other words, Arnold's MIDI audio subsystem 38 is designed to perform a plurality of processes in parallel, whereas the claimed coprocessor is configured to execute a plurality of processes in series.

For at least the above reasons, Applicant believes that the rejection of Claim 1, in light of the amendments to Claim 1, is overcome. Since independent Claim 17 recites similar features, Applicant respectfully traverses the rejection of Claims 1 and 17, and all associated dependent claims, and requests reconsideration of the rejection.

In response to the rejection of independent Claim 19, the outstanding Office Action asserts that Arnold discloses the storing of a plurality of program modules corresponding to the plurality of procedures and data to be processed in an external memory.⁷ Applicant respectfully disagrees, since Arnold describes that a memory 46 is directly accessed by the CPU 42, and MIDI coprocessor 94 accesses a sample memory 152,⁸ which is part of the MIDI audio subsystem 38.⁹ Arnold describes that transferring of data from hard drive 64 into sample memory 152 via DMA is performed for boot-up tests.¹⁰ Accordingly, transferring data from a hard drive to a memory 152, so as to provide digital samples of instrument sets, as disclosed by Arnold, *is not* storing a plurality of program modules corresponding to the plurality of procedures and data to be processed in an external memory, and the subjecting of

⁶ See Arnold at column 10, starting at line 21, "MIDI Audio Subsystem."

⁷ See the outstanding Office Action at page 4, lines 10-11.

⁸ See Arnold at column 11, lines 8-10.

⁹ See Arnold in Figures 2 and 5.

¹⁰ See Arnold at column 11, lines 1-8, and at column 14, lines 57-63.

audio data of the readout data *sequentially to procedures of an audio process*, as recited in Applicant's Claim 19. Arnold further describes that DMA transfer is used for reading sample data from the HDD 64 at high speed. Arnold's program to be executed by the CPU 42 is stored in HDD 64 of the external memory 36. Therefore, Arnold's program does not include *a plurality of procedures of an audio process*, but is simply configured to execute an operating system.

In view of the above comments, Applicant believes that the rejection Claim 19 is overcome, and therefore requests reconsideration of the rejection of Claim 19 under 35 U.S.C. §102(b).

In response to the rejection of Claims 1-3, 6-19, and 24-31 under 35 U.S.C. §102(e) Applicant respectfully traverses the rejection and requests reconsideration of the rejection, as next discussed.

Ezer describes a media coprocessor for performing 3-D graphics, video, and audio functions, wherein audio and video data are processed in different partitions of a time interval.¹¹ However Applicant respectfully submits that Ezer does not teach or suggest the control processor to fetch in, when executing one of divided procedures of an audio process, *a program and audio data corresponding to a next one of the procedures from the external memory*, as recited in independent Claim 1. Ezer's media coprocessor merely receives a variable length code (VLC) digital bitstream.¹² Ezer discloses in Figure 2 that the media coprocessor 102 includes a bitstream processor 201, a signal processor 202, a display processor 203, an audio/video I/O port 204 and a memory controller 205.¹³ However, in Applicant's amended Claim 1, the coprocessor executes multiplication/accumulation addition according to VLIW (Very Long Instruction Word) to subject the audio data to the divided

¹¹ See Ezer in the Abstract, and in Figure 1.

¹² See Ezer at column 3, lines 64-66.

¹³ See Ezer at column 3, lines 57-66 and in corresponding Figure 2.

procedures of the audio process sequentially based on the program, and Ezer is entirely silent on such a feature. Accordingly, Applicant believes that the rejection of Claim 1 is overcome. Furthermore, Claims 15, 17 and 19 recite similar features as recited Claim 1, and therefore, the rejection of Claims 15, 17 and 19, and all associated dependent claims, is also believed to be overcome.

Regarding the rejection of Claims 15 and 21 under 35 U.S.C. §103(a) as unpatentable over Arnold in view of Ezer, Applicant respectfully traverses the rejection and requests reconsideration of the rejection, as next discussed.

Applicant respectfully submits that both references Arnold and Ezer, used by the outstanding Office Action to form the 35 U.S.C. §103(a) rejection, fail to teach or suggest a control processor to fetch in a program and data to be used for a next procedure of an audio process from programs for encoding and decoding, input/output data, work data, table data which are stored in the external memory.

The outstanding Office Action states that Arnold teaches “a control processor (Fig. 3) to fetch in a program and data to be used for a next procedure of an audio process from programs for encoding and decoding, input/output data, work data, table data which are stored in the external memory.”¹⁴ Applicant respectfully disagrees with this position, as already discussed above regarding the 35 U.S.C. §102(b) rejection. Arnold merely describes the transfer of sample music data from the HDD 64 to the memory 152 by DMA, so as to configure the system for boot-up.¹⁵

To remedy the deficiencies of Arnold, the outstanding Office Action turns towards Ezer and states that “Ezer discloses a DMA controller comprising a data memory (407) to store the data fetched by the control processor; an instruction memory (405) to store the

¹⁴ See the outstanding Office Action from page 10, last line, to page 11, line 5.

¹⁵ See Arnold at column 11, lines 5-8.

control programs to be applied to the processor (Fig. 4).”¹⁶ The outstanding Office Action further asserts that the combination of Arnold with Ezer is proper, by reciting that “[t]herefore it would have been obvious to one having ordinary skill in the art to modify Arnold with the teaching of Ezer to provide the DMA controller with a data memory (407) to store the data fetched by the control processor; an instruction memory (405) to store the control programs to be applied to the processor.”¹⁷ However, Ezer also fails to teach or suggest that the control processor fetches in a program and data to be used for a next procedure of an audio process from programs for encoding and decoding, input/output data, work data, table data which are stored in the external memory. According to Applicant’s Claim 15, the read-out of the *program that will be executed next* is completed during *execution of a current process*, and this read-out is performed by DMA transfer, thereby minimizing the latency time for the external memory access. Neither Arnold nor Ezer, taken individually or in combination, teach or suggest such a feature.

In view of the arguments above, the references of record fail to teach or suggest all the features of Applicant’s independent Claim 15, and all associated dependent claims, and therefore Claim 15 is believed to be patentably distinct over Arnold and/or Ezer. Even if the combination of Arnold and Ezer is assumed to be proper, the combination fails to teach every element of the claimed invention. Accordingly, Applicant respectfully traverses, and requests reconsideration of, this rejection based on these patents.¹⁸

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in

¹⁶ See the outstanding Office Action at page 11, lines 9-12.

¹⁷ See the outstanding Office Action at page 11, lines 12-22.

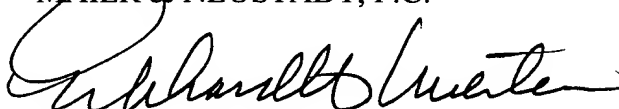
¹⁸ See MPEP 2142 stating, as one of the three “basic criteria [that] must be met” in order to establish a *prima facie* case of obviousness, that “the prior art reference (or references when combined) must teach or suggest all the claim limitations,” (emphasis added). See also MPEP 2143.03: “All words in a claim must be considered in judging the patentability of that claim against the prior art.”

condition for formal Allowance. A Notice of Allowance for Claims 1-3 and 6-31 is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact Applicant's undersigned representative at the below listed telephone number.

Respectfully submitted,

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